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IS 2978 (1986): By-products of lac [CHD 23: Lac, Lac Products and Polishes]

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Indian Standard

SPECIFICATION FOR BY-PRODUCTS OF LAC

(First Revision)

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Gr 4

August 1987

Indian Standard

SPECIFICATION FOR BY-PRODUCTS OF LAC

(First Revision)

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(*Continued on page* 2)

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Indian Standard

SPECIFICATION FOR BY-PRODUCTS OF LAC

(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 20 October 1986, after the draft finalized by the Lac and Lac Products Sectional Committee had been approved by the Chemical Division Council.

0.2 This standard was originally published in 1964 with a view to help the purchasers in assessing the types of the material and its proper utilization. The revision was needed to update its contents in the light of latest developments in manufacturing technique, experienced gained in the use of the standard over the years and to include *KIRI* III type. *MOLAMMA* II has been deleted and the requirement of the volatile matter has also been deleted in this revision.

0.3 This standard contains **4.1**, **4.4** and **5.2.1** which calls for an agreement between the purchaser and the manufacturer, and permits the purchaser to use his option for selection of material to suit his requirements.

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes the requirements and the methods of sampling and test for some of the by-products of lac containing lac resin, namely, *MOLAMMA SPECIAL*, *MOLAMMA* I, *KIRI* I, *KIRI* II, *KIRI* III and *PASSEWA*.

---

*Rules for rounding off numerical values (*revised*).

1.2 The limits prescribed in this standard are limits for rejection.

2. TERMINOLOGY

2.1 For the purpose of this standard, the definitions given in IS : 4908-1968*.

3. TYPES

3.1 There are following types of by-products of lac:

a) *MOLAMMA SPECIAL*,
b) *MOLAMMA* I,
c) *PASSEWA*,
d) *KIRI* I,
e) *KIRI* II, and
f) *KIRI* III.

4. REQUIREMENTS

4.1 Form and Condition — The form and condition of the different kinds of by-products of lac shall be subject to an agreement between the purchaser and the manufacturer.

4.2 Particle Size

4.2.1 The particle sizes for the by-products of lac shall be as follows, when determined by the method prescribed in **A-2**.

MOLAMMA SPECIAL	— 80 percent, minimum, passing through 600-micron IS Sieve [*see* IS : 460 (Part 1)-1978†]
MOLAMMA I	— 80 percent, minimum, passing through 600-micron IS Sieve [*see* IS : 460 (Part 1)-1978†]

4.2.2 There shall be no particle size limitations in the case of *PASSEWA* *KIRI* I, *KIRI* II and *KIRI* III.

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*Glossary of terms used in lac industry.

†Specification for test sieves: Part 1 Wire cloth test sieves (*second revision*).

4.3 Lac Content — *MOLAMMA*, *PASSEWA* and *KIRI* shall contain lac, as calculated in **A-3** within the limits indicated below on moisture free basis:

Material	*Lac Content, Min*	*Percent, Max*
MOLAMMA SPECIAL	80·0	85·0
MOLAMMA I	70·0	Below 80·0
PASSEWA	70·0	No limit
KIRI I	55·0	65·0
KIRI II	40·0	Below 55·0
KIRI III	30·0	Below 40·0

4.4 Colour Index — Colour index for *MOLAMMA* and *PASSEWA* mentioned in **4.3** shall be as agreed to between the manufacturer and the purchase when determined in accordance with the method prescribed in **F-1** of IS : 15-1973*. No limit for colour index of *KIRI* is prescribed.

5. PACKING AND MARKING

5.1 The material shall be packed in 50 or 75 kg new double gunny bags with cotton lining.

5.2 The packages shall be marked with the following:

a) Manufacturers' name, brand or its trade-mark;
b) Name of the material;
c) Batch/Code number; and
d) Month and year of manufacture.

5.2.1 The packages may also be marked with other information as agreed to between the manufacturer and the purchaser.

5.2.2 The packages may also be marked with the Standard Mark.

NOTE — The use of the Standard Mark is governed by the provisions of the Bureau of Indian Standards Act 1986 and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions, under which a licence for the use of the Standard Mark may be granted to manufacturers or producers, may be obtained from the Bureau of Indian Standards.

6. SAMPLING

6.1 Representative samples shall be drawn in accordance with the method prescribed in Appendix B.

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*Specification for seedlac (*second revision*).

6.2 Number of Tests and Criteria for Conformity

6.2.1 Tests for the determination of particle size shall be conducted on the 'original observation sample' (*see* **B-2.1.1** and **B-3.2.1**).

6.2.2 Tests for the determination of lac content shall be conducted on the 'analysis sample' (*see* **B-3.1.2** and **B-3.2.2**).

6.2.3 Tests for the colour index of *MOLAMMA SPECIAL* shall be conducted on the 'analysis sample' (*see* **B-3.1.2**).

6.2.4 A lot shall be declared as conforming to this specification, if the test results on the 'original observation sample' and the 'analysis sample' satisfy the corresponding requirements given in **3**.

APPENDIX A

(*Clauses* 4.2.1 *and* 4.3)

METHODS OF TEST

A-1. QUALITY OF REAGENTS

A-1.1 Unless specified otherwise, pure chemicals shall be employed in the tests and distilled water (*see* IS : 1070-1977*) shall be used where the use of water as a reagent is intended.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the result of analysis.

A-2. PARTICLE SIZE OF *MOLAMMA SPECIAL* AND *MOLAMMA I*

A-2.1 Principle — A known mass of the sample is sieved through 600-micron IS sieve and the mass of material passing through noted.

A-2.2 Procedure — For this test, use the 'original observation sample'. Breakdown loose lumps, if any, by gentle rubbing between fingers. Weigh approximately 100 g into 600-micron IS sieve and sieve using a gentle rocking motion till nothing more passes through. Collect the material passed through and weigh.

A-2.3 Calculation

$$\text{Material passing through 600-micron IS sieve, percent by mass} = \frac{100\, M_1}{M}$$

where

M_1 = mass of the material which passed through, and

M = mass of the material taken.

---

*Specification for water, for general laboratory use (*second revision*).

A-3. LAC CONTENT OF BY-PRODUCTS OF LAC

A-3.1 Principle — The value of lac content of by-products of lac is obtained by deducting from 100 the sum of percentages of moisture (*see* **A-7**), non-volatile matter insoluble in cold alcohol (*see* **A-4**), non-volatile matter soluble in water (*see* **A-5**) and rosin (*see* **A-6**).

A-3.2 Calculation

$$\text{Lac content, percent} = 100 - (a + b + c + d)$$

where

a = percentage of volatile matter (moisture);
b = percentage of non-volatile matter insoluble in cold alcohol;
c = percentage of non-volatile matter soluble in water; and
d = percentage of rosin, if any.

A-4. DETERMINATION OF NON-VOLATILE MATTER INSOLUBLE IN COLD ALCOHOL

A-4.1 Principle — A known mass of the material is leached out with cold alcohol, the residue is dried at 100 ± 2°C and weighed in order to get the matter insoluble in cold alcohol.

A-4.2 Reagent

A-4.2.1 *Ethyl Alcohol* — 95 percent (by volume) rectified spirit (conforming to IS : 323-1959*) or denatured spirit (conforming to IS : 324-1959†), redistilled before use.

A-4.3 Apparatus

A-4.3.1 *Funnel* — glass, 75 mm diameter.

A-4.3.2 *Watch-Glass* — 100 mm diameter.

A-4.3.3 *Beaker* — lipped, capacity 200 ml.

A-4.3.4 *Glass Rod*

A-4.3.5 *Weighing Bottle*

A-4.4 Procedure

A-4.4.1 Weigh 4·5 to 5·5 g of the 'prepared sample' (*see* **B-4.1**) to an accuracy of ±0·01 g and place in a 200 ml lipped beaker and add 100 ml of the alcohol at 27 ± 2°C, stir frequently with a glass rod for 2 hours to dissolve all the soluble matter. Then let the beaker stand at 27 ± 2°C for 2 hours without stirring.

---

*Specification for rectified spirit (*revised*).
†Specification for denatured spirit (*revised*).

A-4.4.2 In the meantime, fit a 12·5 cm double acid washed, retentive, low ash *filter paper in the funnel and wash thoroughly with alcohol. Dry in a warm place to drive off as much of the alcohol as possible and then transfer to a weighing bottle. Dry the weighing bottle containing the filter paper to constant weight in an oven maintained at 100 ± 2°C. Fit the filter paper again into the funnel, wet into position with ethyl alcohol and filter the solution of the 'prepared sample' by gravity, keeping the funnel covered lightly with a close fitting watch-glass to prevent quick evaporation of the alcohol and consequent encrustation of lac at the top edge of the filter paper.

A-4.4.2.1 Conduct this filtration, if possible, inside a sufficiently large bell-jar containing, in a basin, a small quantity of ethyl alcohol to reduce evaporation of the solvent.

A-4.4.3 After the material is transferred, clean the beaker of the insolubles with the aid of ethyl alcohol at 27 + 2°C using a rubber tipped glass rod and wash the residue on the filter paper thoroughly till the filtrate is practically colourless. Keep the funnel with the filter paper in a warm place to drive off most of the alcohol. Cautiously transfer the filter paper with the residue to the weighing bottle and dry to constant weight in an oven at 100 ± 2°C.

A-4.5 Calculation

$$\text{Non-volatile matter insoluble in cold alcohol, percent} = \frac{M_1}{M} \times 100$$

where

M_1 = mass in g of residue, and
M = mass in g of the sample taken.

A-5. DETERMINATION OF NON-VOLATILE MATTER SOLUBLE IN WATER

A-5.1 Principle — A known weight of the powdered material is digested with water, made up to a known volume and filtered. The weight that goes into solution is determined by evaporating an aliquot portion of the filtrate to constant weight and calculating for the whole solution.

A-5.2 Procedure

A-5.2.1 Finally grind a sufficient quantity of the 'prepared sample' (*see* **B-4.1**) to completely pass through a 250-micron IS sieve. Weigh 20 to 25 g of the powdered sample to an accuracy of 0·1 g and transfer to a beaker. Add 200 ml of distilled water at 27 ± 2°C, and stir thoroughly. Cover the beaker with a watch-glass and allow it to stand at 27 ± 2°C for 4 hours with occasional stirring.

---

*Whatman No. 40 or its equivalent is suitable.

A-5.2.2 Filter into a 250-ml volumetric flask. Wash the residue and the filter paper with distilled water and make up to the graduation mark. Transfer a measured volume of the filtrate by means of a pipette into a weighed evaporating dish and evaporate to dryness over a boiling water bath. Dry the residue to constant weight in an oven maintained at 100 ± 2°C.

A-5.3 Calculation

$$\text{Non-volatile matter soluble in water, percent} = \frac{M_1}{v\,M} \times 2{\cdot}5 \times 10^4$$

where

M_1 = mass of residue,
v = volume in ml taken for evaporation, and
M = mass of sample taken.

A-6. DETECTION AND DETERMINATION OF ROSIN

A-6.1 Principle — The presence of rosin is first confirmed by the qualitative method and, if present, it is determined quantitatively.

A-6.2 Detection by Halphen Hicks Method

A-6.2.1 *Reagents*

A-6.2.1.1 *Ethyl alcohol* — absolute (conforming to IS : 321-1952*).

A-6.2.1.2 *Acetic acid* — glacial.

A-6.2.1.3 *Petroleum hydrocarbon solvent* — boiling point below 80°C.

A-6.2.1.4 *Solution A* — One part of phenol dissolved in 2 parts of carbon tetrachloride by volume.

A-6.2.1.5 *Solution B* — One part of bromine dissolved in 4 parts of carbon tetrachloride by volume.

A-6.2.2 Procedure

A-6.2.2.1 Place about 2 g of the 'prepared sample' (*see* **B-4.1**) in a 250-ml Erlenmeyer flask, add 10 ml of ethyl alcohol or acetic acid, and shake until solution of the resinous material is complete. Then add slowly and with continuous agitation 50 ml of petroleum hydrocarbon solvent. After the addition of petroleum hydrocarbon solvent add 50 ml of water in exactly the same manner, transfer to a small separating funnel, and allow it to stand until the petroleum hydrocarbon solvent separates. Draw-off the water layer, wash the petroleum hydrocarbon solvent layer once with water, and then filter the petroleum hydrocarbon solvent extract through a dry filter paper into a round bottom evaporating dish. Evaporate to dryness on a steam-bath and test the residue as follows.

---

*Specification for ethyl alcohol (absolute alcohol).

A-6.2.2.2 Add 1 to 2 ml of solution A to the residue and pour this mixture into a cavity of a porcelain colour reaction plate until it just fills the depression. Immediately fill an adjacent cavity with solution B. Cover the plate with an inverted watch-glass and note the colour, if any, produced in solution A or in its creeping edge by the action of bromine vapours from solution B.

A-6.2.2.3 A decided purple or deep indigo blue colour is an indication of the presence of rosin

A-6.3 Determination by Langmuir Method

A-6.3.1 *Principle* — This method is based upon the wide difference between the iodine number of shellac, which is arbitrarily taken as 18 and that of rosin which is taken as 228. A simple calculation using the iodine number found gives the percentage of rosin.

A-6.3.2 *Apparatus*

A-6.3.2.1 *Thermometer* — A solid stem thermometer calibrated between 10° and 65°C at 0·1°C intervals and with the 0°C point marked on the stem is recommended. The thermometer shall have an auxiliary reservoir at the upper end, a length of about 370 mm and a diameter of about 6 mm. It is recommended that the thermometer be certified by a body recognized for such work in the country.

A-6.3.3 *Reagents*

A-6.3.3.1 *Standard shellac* — With every set of tests, run a determination on a sample of unadulterated shellac and the iodine number obtained for the standard shellac should be within ±0·5 of known iodine number.

A-6.3.3.2 *Acetic acid* — Glacial, 99 percent, having a melting point of 14·8°C and free from reducing impurities. If these requirements, determined as described below, are not complied with, the results will be erratic:

a) *Determination of melting point* — Fill a test-tube, 150 mm long, about two-thirds with acetic acid and insert into the acid the thermometer by means of a cork stopper fitting the test tube. The amount of acid should be at least double the quantity required to cover the bulb of the thermometer when the bottom of the latter is 12 mm from the bottom of the test tube. Suspend this test-tube within a larger test tube by means of a split cork. Cool the acid by immersing the assembly in ice water until the temperature is 10°C, then withdraw the assembly from the ice water and stir the acid, rather vigorously for a few moments, thus causing the super cooled liquid to crystallize partially and give a mixture of liquid and solid acids. Take thermometer readings every 15 seconds and consider at the true melting point that temperature at which the reading remains constant for at least 2 minutes.

b) *Test for reducing impurities (potassium permanganate test)* — Dilute 2 ml of the acetic acid with 10 ml of water, add 0·1 ml of 0·1 N potassium permanganate solution and maintain at 27 + 2°C. At the end of 2 hours, the pink colour shall not be discharged.

A-6.3.3.3 *Chloroform* — acetone-free.

A-6.3.3.4 *Standard sodium thiosulphate solution* — approximately 0·1 N. Dissolve pure sodium thiosulphate ($Na_2S_2O_3$ $5H_2O$) in water which has been boiled to free it from carbon dioxide, so that about 25 g of sodium thiosulphate will be present in one litre of the solution. It is best to let this solution stand for about two weeks before standardizing. Standardize with pure resublimed iodine or acid potassium iodate. Preserve in a stock bottle covered with black paper, and fitted with a guard tube filled with soda lime. A few drops of chloroform may be added to the solution for better preservation. The strength of the solution should be checked occasionally.

A-6.3.3.5 *Starch solution* — Make a paste of 0·2 g of soluble starch in cold water and pour into 100 ml of boiling water. Boil for 5 minutes, cool and bottle. The solution should be prepared fresh every 2 or 3 days.

A-6.3.3.6 *Potassium iodine solution* — Prepare a fresh solution by dissolving 10 g of potassium iodine, free from potassium iodate, in 90 ml of water.

A-6.3.3.7 *Wij's iodine monochloride solution* — Dissolve 18 g of iodine in a litre of the acetic acid using gentle heat, if necessary, and determine the strength by titration with standard sodium thiosulphate solution. Set aside 50 to 100 ml of the solution and introduce dry chloride gas into the remainder until the characteristic colour change occurs, and the halogen content has been more doubled, as ascertained again by titration. If the halogen content has been more than doubled, reduce it by adding the requisite quantity of the iodine-acetic acid solution. A slight excess of iodine does not harm, but avoid an axcess of chlorine.

Example:

If the titration of 20 ml of original iodine-acetic acid solution required 22 ml of standard thiosulphate. 20 ml of the finished Wij's solution should require between 43 and 44 ml and not more than 44 ml of the same sodium thiosulphate solution.

A-6.3.4 *Procedure*

A-6.3.4.1 Accurately weigh about 0·2 g sample of 'prepared sample' (*see* **B-4.1**) and introduce into a 250-ml dry, clear, glass bottle having a ground-glass stopper. Add 20 ml of acetic acid and place the bottle on the top of a hot water-bath at 65 to 70°C, swirling the bottle occasionally; until solution is complete, except for the wax. This should not require more than 15 minutes. Unadulterated shellac dissolves with some difficulty, solution is quicker according to percentage of rosin present. Add 10 ml of chloroform, and cool the solution to 21·5 to 22·5°C, for at least 30 minutes half immersed in a shallow pan of water which is either well insulated or equipped with a suitable thermostat. Add 20 ml of the Wij's solution which shall be at a temperature of 21·5 to 22·5°C, from a pipette having a rather small delivery time (about 30 seconds), close the bottle, place it again in the pan of water and note the time. Keep the bottle half immersed in the water at 21·5 to 22·5°C for one hour. Swirl the bottle occasionally during this period. After exactly one hour, add 10 ml of potassium iodide solution, washing into the bottle with it and Wij's solution left on the stopper. Titrate the solution immediately. Run in rapidly 25 to 30 ml of the standard sodium thiosulphate solution and shake vigorously until the solution assumes a straw colour. Now add 15 ml of starch solution and slowly finish the titration. The end point is sharp. Disregard any colour returning after about 30 seconds.

NOTE — If a number of samples is being run, at least 5 minutes shall be allowed between the additions of Wij's solution to facilitate titrations.

A-6.3.4.2 A blank determination shall be run under the same conditions, on the same reagents and by the same person but without using the material.

A-6.3.5 *Calculation*

A-6.3.5.1 Iodine number is given in centigrams of iodine required by 1 g of the sample.

A-6.3.5.2 The iodine number of the sample shall be calculated from the difference between the blank titration and the titration of the sample and the iodine equivalent of sodium thiosulphate solution.

A-6.3.5.3 The percentage of rosin is given by the following formula:

$$R = \frac{100\ (N - 18)}{211{\cdot}5}$$

where

R = percentage of rosin in sample, and

N = iodine number of sample.

A-6.3.5.4 The figure 18 in the above formula is not intended to denote iodine number of genuine shellac, but the whole formula is designed to calculate a figure *R* for rosin content on an agreed basis.

A-7. DETERMINATION OF MOISTURE

A-7.1 Principle — The volatile moisture content is determined by heating a weighed specimen of the 'original observation sample' at 100 ± 2°C for 4 hours and weighing again at room temperature.

A-7.2 Procedure — For this test, use the 'original observation sample' ground to specified size (*see* **B-4.2**). Weigh a clean, dry, flat-bottomed dish of about 75 mm diameter provided with a ground-glass cover. Transfer approximately 2 g of the powdered sample to the dish and spread it into as thin a layer as possible. Cover with the ground-glass cover and weigh again. The difference gives the mass of the sample taken.

A-7.2.1 Keep the dish with the sample, without covering it, in a well ventilated oven maintained at 100 ± 2°C for 4 hours. At the end of this period, transfer the dish to a desiccator containing concentrated sulphuric acid. After 30 minutes, weigh the dish with the sample.

A-7.3 Calculation

$$\text{Moisture, percent} = \frac{100\ (\ M - m\ )}{M}$$

where

M = mass of sample, taken; and

m = mass of sample after drying.

APPENDIX B

(*Clause* 6.1)

*SAMPLING OF BY-PRODUCTS OF LAC

B-1. GENERAL

B-1.1 In drawing, preparing, storing and handling test samples, the following precautions and directions shall be observed.

---

*This scheme provides testing of composite samples only. Composite samples (or average samples) representing the composition of a batch or control unit of material are tested when the interest is in the average quality only, and the variation within the batch is either small or not important from the point of view of performance requirements.

B-1.2 Precautions shall be taken to protect the samples, the material being sampled, the sampling implements and the containers for samples from adventitious contamination.

B-1.3 Only original unopened packages shall be sampled.

B-1.4 The samples shall be placed in suitable, clean, dry and air-tight containers on which the material has no action.

B-1.5 Each sample container shall be sealed air-tight after filling and marked with full details of sampling, the date of sampling, etc.

B-1.6 Unused portions of samples shall be sent to the purchaser on request.

B-2. SCALE OF SAMPLING

B-2.1 Lot — All the packages in a single consignment of the material drawn from a single batch of manufacture shall constitute a lot. If the consignment is declared, or known to consist of different batches of manufacture, the packages belonging to the same batch shall be grouped together and each such group shall constitute a separate lot.

B-2.1.1 Samples shall be tested from each lot for ascertaining conformity of the material to the requirements of the specification.

B-2.2 The number of packages (n) to be chosen from a lot shall depend on the size of the lot (N) and shall be in accordance with Table 1.

TABLE 1 NUMBER OF PACKAGES TO BE SELECTED

LOT SIZE N (1)	NO OF PACKAGES TO BE SELECTED n (2)
Up to 100	10
101 to 300	15
301 to 600	18
601 to 1 000	20

B-2.3 The packages shall be selected at random. In order to ensure the randomness of selection, procedures in IS : 4905-1968* may be followed.

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*Methods for random sampling.

B-3. TEST SAMPLES AND REFEREE SAMPLES

B-3.1 *MOLAMMA SPECIAL* and *MOLAMMA I* — Samples shall be taken from different places in each package by means of a suitable samples so as to yield a total of 5 kg of material consisting of approximately equal portions from each package sampled. The material shall then be thoroughly mixed and heaped and quartered along two diameters which intersect at right angles, and two opposite quarters mixed.

B-3.1.1 One half of the material shall be termed as the 'original observation sample' and shall be divided into three equal parts, one for the purchaser, another for the manufacturer and the third to be used as the referee sample.

B-3.1.2 The other half of the material shall be for the 'analysis sample' and shall be ground to pass entirely through 2·00 mm IS sieve. The material shall then be thoroughly mixed and divided into three equal parts, one for the purchaser, another for the manufacturer and the third to be used as the referee sample.

B-3.2 *PASSEWA* and *KIRI I*, *KIRI II* and *KIRI III* — Samples shall be taken from different places in each package by chipping or other suitable means so as to yield a total of 5 kg material consisting of approximately equal parts from each package sampled. The material shall then be halved by suitable means.

B-3.2.1 One half of the material shall be termed as the 'original observation sample' and shall be divided into three equal parts, one for the purchaser, another for the manufacturer and the third to be used as the referee sample.

B-3.2.2 The other half of the material shall be for the 'analysis sample' and shall be ground to pass entirely through 2·00 mm IS sieve. The material shall then be thoroughly mixed and divided into three equal parts, one for the purchaser, another for the manufacturer and the third to be used as the referee sample.

B-3.3 Referee Sample — The referee sample shall consist of the 'original observation sample' and the 'analysis sample' marked for this purpose and shall bear the seals of the purchaser and the supplier. These shall be kept at a place agreed to between the purchaser and the manufacturer and shall be used in case of dispute between the two.

B-4. PREPARATION OF SAMPLES FOR TESTING

B-4.1 The 'analysis sample' (*see* **B-3.1.1** and **B-3.1.2**) shall be ground to pass entirely through 425-micron IS sieve. This finely ground material shall be mixed thoroughly and divided into the requisite number of samples for testing in accordance with the requirements of this standard. These samples shall be placed in air-tight containers, sealed and labelled as 'prepared samples'.

B-4.2 The 'original observation sample' (*see* **B-3.1.1** and **B-3.2.1**) which is to be used for the determination of volatile matter (moisture) shall be ground to pass through 850-micron IS sieve.

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